SOLUTION-BASED FABRICATION OF PHOTOVOLTAIC CELL

ABSTRACT OF THE DISCLOSURE

An ink for forming CIGS photovoltaic cell active layers is disclosed along with methods for making the ink, methods for making the active layers and a solar cell made with the active layer. The ink contains a mixture of nanoparticles of elements of groups IB, IIIA and (optionally) VIA. The particles are in a desired particle size range of between about 1 nm and about 500 nm in diameter, where a majority of the mass of the particles comprises particles ranging in size from no more than about 40% above or below an average particle size or, if the average particle size is less than about 5 nanometers, from no more than about 2 nanometers above or below the average particle size. The use of such ink avoids the need to expose the material to an H_2Se gas during the construction of a photovoltaic cell and allows more uniform melting during film annealing, more uniform intermixing of nanoparticles, and allows higher quality absorber films to be formed.